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By far the most interesting fern in the two localities is *A. montanum*, although the finding of either *A. Bradleyi* or *A. ebenoides* would in itself be a pleasure without alloy. The western spur of the Great North Mountain is called the Catamount Ridge, and takes the form of a tall narrow ridge about five miles or so in length, and having at times sides which are perpendicular for fifty feet or more. All along this ridge, *A. montanum* can be found. It is practically impossible for this station to be wiped out of existence by any of the common causes for such disasters. In the first place, the huge bare rocks preclude the idea of a forest fire destroying the plants, the stone itself is of little value, even for building purposes, while to gather more than a small proportion of the plants would require the agility of a circus acrobat and at least a fifty foot ladder. In view of the comparative rarity of this fern, and its gradual disappearance from some of its former haunts, it is a great pleasure to be able to record the existence of such a wonderful station which bids fair to be with us for many years to come.

WASHINGTON, D. C.

Notes and news

MORE ABOUT THE HABITAT OF OPHIOGLOSSUM

While the subject of the habitat of *Ophioglossum vulgatum* is still warm a few notes from southwestern Vermont may not be amiss. In this connection it is interesting to learn what Clute in "Our Ferns in Their Haunts" says of it.

"Doubtless the most promising place to look for it is among the grasses and sedges in moist meadows, but upon this point there is considerable difference of opinion. Some years ago, in the *Fern Bulletin*, several writers gave their experiences in collecting it. One

wrote that in northern New York he found it in 'dry pastures, on and about hummocks of hemlock loam,' and added 'it is seldom found in moist places.' Another in Vermont says, 'in old meadows, they will grow in little hollows where it is richer and more moist,' while still another in Kentucky found it common 'in dry open woods,' and the writer that 'it may safely be looked for in red cedar groves,' adding, 'I know few such places where it does not grow.' In contrast to these, Mr. A. A. Eaton has found fine large plants in seven inches of sphagnum moss in New Hampshire swamps."

In Gray's "New Manual" the habitat is given as: "Meadows and pastures, rarely on dry slopes," which is much the same as that quoted from D. C. Eaton on page 43 of the current volume of the JOURNAL.

My own experience goes to show that, like Mr. Jenks, "unnoticed" is a better term to use in describing the frequency of its occurrence than "uncommon"; still it may well be that, like so many other plants, it is common in some sections and rare in others without any apparent reason. Whenever I have been to the summer meetings of the Vermont Botanical Club there are always some people present to whom it is rare.

I have specimens from the Anaquassacook meadows near Shushan, N. Y., as mentioned by Mr. Burnham on page 47 of the JOURNAL, where it was shown to me as being something rare. I also found it in a cedar swamp near Fair Haven, Vt., when with the Vermont Botanical Club last summer. In West River Valley I find it in bogs, moist pastures, and today (May 29) on a "dry slope" with a southeastern exposure and without shade of any kind. My specimens from Shushan, N. Y., are somewhat taller and more slender than those from a "moist pasture," but this may well be in part from the competition for light in the wetter meadow which is less keen in dry places.

LESTON A. WHEELER.

TOWNSHEND, VERMONT.

I find *Ophioglossum* everywhere except in sphagnum. I found them in Salisbury, Conn., in an old cart-path on the mountains. Here they grow in every pasture, right out in the open, along with *Antennaria* and hawkweed. I have found them in clear sand along a railroad, and in dry, open ground at an elevation of over 1400 feet. I mention this last because I was told by a fern student that there was a tradition that *Ophioglossum* had never been found above 600 feet. I fancy that here they may be found in any place where there is clay soil or subsoil to hold the water.

MRS. ORRA PARKER PHELPS.

CANTON, N. Y.

Mr. R. A. Ware contributes the following list of habitats for *Ophioglossum* as recorded on the sheets in his herbarium: Georgeville, Quebec, cedar swamp; Pleasant Ridge, Somerset Co, Maine, "with *Liparis Loeselii* in slight depression in open, upland grass field"; Dover, Maine, meadows; Hinsdale, N. H., sphagnum swamp; Alton, N. H., wet meadow; Westmore, Vt., "upland, open grass field, with young plants of *Onoclea sensibilis* after mowing"; Harvard, Mass., in sphagnum; Plainville, Conn., moist rocky woods; Cornwall, Conn., dry, wooded hillside; Mansfield, Conn., open bog; Lima, Delaware Co., Pa., swamp. Also specimens labeled *O. arenarium* from "Longport, N. J., sea beach."

DOES OPHIOGLOSSUM VULGATUM REQUIRE TEN YEARS
FROM SPORE TO FIRST GREEN LEAF?

In addition to the points mentioned in a recent number, Prof. Campbell has brought out in his monograph of the Eusporangiatæ many other very interesting points re-

garding *Ophioglossum* and *Botrychium*. Two of these which are of special interest relate to *O. vulgatum* and *B. Lunaria*.

When a spore of *O. vulgatum* germinates it appears probable from the work of Bruchman as reported by Campbell that the first green leaf is ten years in getting above ground. This first green leaf is really the second leaf of the plant and is always sterile. The third leaf may be fertile but is not always so.

A similarly long time is required by *B. Lunaria* to produce its first fertile leaf if Bruchman's conclusions regarding this species are correct. He reports that there are first produced seven to nine scale leaves at the rate of one a year. Following these come the green and fertile leaves. In *B. virginianum*, however, the first leaf produced is believed to extend above ground, although it is not fertile. The time required is not stated.

Two points of interest attach to these facts. First, imagine planting spores or seeds and then having to wait ten years to have the crop appear above ground! Second, it is probable that the long developmental period required explains some of the peculiarities in distribution of various species of these two genera. It is a common experience to search very thoroughly some likely place for *Ophioglossum* without finding a single plant. One may even have difficulty in finding the species in the same station two years in succession.

If it requires ten years for *O. vulgatum* to develop its first green leaf from the spore stage one can understand why a field which had been ploughed nine years previously would show no plants of this species, even though conditions were in all other respects favorable. If we go a little farther with hypothesis and suppose that the next year ten fruiting plants were found and all collected we should then have to wait ten years more for another crop, assuming that some spores had dropped in connection with the collection.

I hereby invite all those who contributed to the very satisfactory answer to my earlier question as to the habitat of *Ophioglossum* to turn their attention to a new enquiry along the same lines. Does *O. vulgatum* require ten years to produce its first green leaf? The method of answer will be easy. Visit any station you may know, as many as possible, and find out from the owners of the land, or otherwise, whether it has been cultivated within ten years. It is practically certain that ploughing, etc., would destroy all rooted plants and require a sowing of spores for the production of more plants. If any one finds a station which has certainly been under cultivation within ten years it will serve to amend the conclusions of Bruchman noted above.

R. C. BENEDICT.

Of interest, especially in connection with the field meeting of the Society in Onondaga County, New York, is the publication by a member of the Society, Mrs. L. Leonora Goodrich, of a Flora of Onondaga County as collected by the Syracuse Botanical Club of which Mrs. Goodrich has been president for many years. The list includes fifty-two different kinds of ferns and allies, eleven lycopods, and seven equisetes. To this may certainly be added three hybrids in *Dryopteris* and possibly also *D. simulata* which is known to occur just over the border in Oneida County. Seventy species of pteridophytes makes a very good list for one county of about forty miles square. It may well be added that the Syracuse Botanical Club with its one honorary male member, Rev. Dr. Beauchamp, has done a great deal in making the flora of Onondaga County known.

R. C. B.

A REVIEW: W. R. MAXON. REPORT UPON A COLLECTION OF FERNS FROM WESTERN SOUTH AMERICA¹

The ferns referred to in the report here considered were collected in Peru, Chile, and Bolivia, by Dr. and Mrs. J. N. Rose in the latter part of 1914. The special object of the trip was the collection of cacti. Of the twenty-five species listed by Mr. Maxon, twenty-two are ferns and three so-called "fern allies," i. e., equisets and lycopods. Five of the ferns are found to be new species, as follows: *Polypodium*, two, *Cheilanthes*, two, and *Notholaena*, one.

This large proportion of new species is of special interest as an emphasis of the fact that the Andean chain, both in South America and in North America, is probably the most extensive terra incognita of ferns now left to be explored. Every collection from these regions includes numerous new species. Dr. Rose's expedition for cacti naturally took him into regions poor in ferns, but even these yielded over twenty per cent. new species. In the regions of greater rainfall, the moist forested slopes toward the west, not only are there many more species, hundreds indeed, but there are also at least as large a proportion of undescribed forms.

R. C. B.

American Fern Society

THE SYRACUSE MEETING

A field meeting of the Society was held, as announced, July 13-16, with headquarters at Syracuse, and with a total attendance of about forty. Nine new members were enrolled during the meeting.

The visiting members were very hospitably received. Mr. and Mrs. William Spalding entertained them most

¹ Smithson. Misc. Coll. 65: no. 8. 1-12. 3 May 1915.